Federal Aviation Administration - Fairbanks Flight Standards District Office
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AIRWORTHINESS NEWSLETTER

for Inspection Authorization Holders, A&Ps and Repairmen

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INTRODUCTION

February is here again and it's time for another newsletter. We hope everyone had a pleasant holiday season and survived the dark days of winter. Go toward the light! Don't forget, this publication is for you, the maintenance professional, and your compliments, criticisms, and ideas are important in keeping this publication informative, interesting, and helpful as you go about your vital tasks.

IAs don't forget to renew in the month of March. Many of the FAA maintenance safety meetings count as renewal training. Contact the FSDO Safety Team at (907) 457-9260 for verification of attendance and to determine which meetings are good for credit. Future meeting subjects and schedules will be mailed to you well in advance so you can make your plans for attendance. You may also want to check the Fairbanks Flight Standards web page at: www.alaska.faa.gov/fai/fsdo.

IA RENEWAL SEMINAR

Aviation & Electronic Schools of America will conduct an IA refresher course on March 9, 2000, at the Comfort Inn in Fairbanks. Call (800) 345-2745 for specifics. Inspectors will be present to renew your authorization.

Enclosed with this newsletter is FAA Form 8610-1, Mechanics Application for Inspection Authorization. If you plan to renew by mail, include FAA Form 8610-1 and FAA Form 8310-5, mail to the address above, and please put "IA Renewal" on the outside of the envelope.

INSPECTORS

Changes in the inspector ranks have continued. Greg Hibdon had to leave us and Dan Walsh will be transferring. Needless to say, our airworthiness folks are going to be busy! However, our inspectors will do their best to take care of your requirements in a professional and timely manner. For those of you who remember Ed Bentley, he is living in Arizona and doing well.

Fairbanks Airworthiness Inspectors:

James H. Tupper - Supervisor
George W. Earp
John Q. Gamble
Caleb A. Glick
Harley A. Holt
Eric L. Jones
Hugh A. Keith
Steve Ketzer, Jr.
Cary J. Meier
Kenneth C. Thomas
Daniel H. Walsh

You may contact them by phone at (907) 474-0276, or by email using the following format: first name.middle initial.last name@faa.gov. No spaces, no caps. If you have questions or a problem, give them a call. They are here to help you!

An Important Note

Our latest guidance classifies radio installations, including intercoms and ELTs, as *major alterations*, and therefore requires an FAA Form 337. Remember to reference approved data or apply for a field approval.

SUBJECTS FOR UPCOMING A/W SAFETY MEETINGS

- ELTs
- Hartzell Propellers
- HAZMAT

If there is a particular topic you would like to see highlighted at a safety meeting, all you need to do is contact the Safety Program Team: Jim Porter, George Earp, or Annette Robinson at (907)457-9260, and they will see what magic they can weave to make your meeting idea a reality. Also, if you have any questions about the Safety Program, contact one of them.

QUESTIONS AND ANSWERS, APPROVED DATA, AND OTHER INTERESTING STUFF

In the August 1999 issue of this newsletter there was a question about what inspection was required on an IFR aircraft after the installation of an encoder. The answer was FAR Part 43, Appendix E and F. Dave Wurm, Galena Avionics, pointed out that the tests are also required on VFR aircraft (See FAR Part 91.215 and FAR Part 91.413). **Thanks, Dave!**

QUESTIONS AND ANSWERS
(Steve Ketzer, Jr., Airworthiness Safety Inspector)

Q - If I'm doing an annual or 100 hour inspection on an aircraft and using the checklist given under FAR Part 43, Appendix D, do I still need the manufacturer's maintenance manual?

A - Yes. FAR Part 43.13(a) requires you to use the *current manufacturer's maintenance manual* unless you're using other data acceptable to the FAA Administrator. FAR Part 43, Appendix D, simply provides a checklist; it doesn't provide limits and other inspection criteria.

Q. - But, FAR Part 43.13(a) just says maintenance and alteration, so that doesn't cover inspection and repair, right?

A. - Wrong. FAR Part 1 defines maintenance and states, *"Maintenance," means inspection, overhaul, repair, preservation, and the replacement of parts, but excludes preventative maintenance.*

Q. - I have several current aircraft maintenance manuals, but none of them say FAA APPROVED, does that make any difference?

A. - Often not. Most large US aircraft manufacturers have been given Delegation Option Authorization (DOA) by the FAA, which means they may, among other things, issue airworthiness certificates for the aircraft they manufacture, and develop and approve instructions for continued airworthiness, e.g., service manuals (see AC 43.9-1E and FAR Parts 21 and 23). And again, FAR Part 43.13(a) tells you to use the current manufacturer's maintenance manual.

Q. - I hear someone is selling Piper Service Manuals on CD, but it isn't Piper. Can I use the CD as current manufacturer's data?

A. - Yes, if the company is a licensed vendor for Piper (Avantex is, by the way).

Q. - FAA inspectors ask to see my *special tools*, like torque wrenches, cable tensionometers, micrometers, multi-meters, and so on. Where does it say I have to have that stuff and have it tested and calibrated?

A. - What tools you're required to have depends on what you are doing. FAR Part 43.13(a) states you will use tools, equipment and test apparatus to do the work in accordance with accepted

industry standards. Additionally, it says if the manufacturer recommends special equipment or test apparatus, you must use it or an equivalent acceptable to the FAA Administrator.

Q. - I recently performed an inspection on a Cessna that had engine and propeller logbooks, too. I made an annual inspection entry in both of those logs and gave the time since overhaul, but not the aircraft total time. My A&P buddy said I should have given the aircraft total time. Is she right?

A. - Yes, she's right. FAR Part 43.11(a)(2) states if you approve or disapprove an aircraft, airframe, aircraft engine, propeller, component or appliance part, you should make a record entry in the maintenance record *of that equipment*, and give, among other things, the date of the inspection and *aircraft total time in service*.

Q. - So engine and propeller *time since overhaul* and *total time* in service don't matter?

A. - Oh, yeah, they matter. They matter a great deal. In accordance with FAR Part 91.417(a)(2), the owner or operator is required to keep *total time* in service and *time since last overhaul* of all items that are required to be overhauled.

Furthermore, FAR Part 91.417(b)(2) states those records will be kept and transferred when the aircraft is sold. And FAR Part 91.417(c) states the owner or operator must make those records available if the FAA or NTSB asks to inspect them.

Q. - Yeah, but that's a FAR Part 91 rule. What does it matter to A&P mechanics?

A. - You're right. It's an owner/operator problem, but as you know most of them rely on mechanics to calculate their total time and time since overhaul. Consider it a customer service.

Q.- I've done a number of inspections where the engine or *propeller total time in service* was given as *unknown*. The regulation says they must have it. What should I do?

A. - Sometimes the manufacturer will provide guidance on how to arrive at total time when total time is unknown or the aircraft records have been lost. If the manufacturer does not provide guidance, use the guidance in Advisory Circular 43-9C to arrive at a total time.

Q.- It looks like computers are here to stay. Can I keep all required maintenance records on computer?

A. - No. While computer records are great for scheduling and tracking, they do not fully satisfy the record keeping requirements of FAR Parts 43 and 91 (see AC 43-9C).

Q.-Well, I'm out of questions. Do you have anything else for me?

A. - Yeah, it is written in the Bhagavad Gita, *"Work done with anxiety about results is far inferior to work done without such anxiety,"* but that ain't regulatory. See ya*!*

FAIRBANKS FLIGHT STANDARDS DISTRICT OFFICE
RECOMMENDED SUPPLEMENTAL EMERGENCY LOCATOR TRANMISTTER (ELT)
INSPECTION PROCEDURE
(Caleb Glick, Airworthiness Safety Inspector)

This notice responds to requests for guidance on compliance with the ELT inspection requirements of FAR Part 91.207. This information is contained in FAA Notice A8310.1, September 23, 1988, and A8150.3, July 23, 1990. The FAA published those notices to improve the confidence level that ELT's are functional and to reduce the number of false transmissions. The FAA recommends the procedures as a supplement to regulatory requirements as well as manufacturer's instructions.

1. Remove all interconnections to the ELT unit and ELT antenna. Visually inspect and confirm proper seating of all connector pins. Special attention should be given to coaxial center conductor pins which are prone to retracting into the connector housing.

2. Remove the ELT from the mount and inspect the mounting hardware. All required mounting hardware should be installed and secured.

3. Gain access to the ELT battery and inspect. No corrosion should be detected. Verify the ELT battery is approved and check its expiration date, also check the ELT remote panel switch battery expiration date and record.

4. Activate the ELT using an applied force. Consult the ELT manufacturer's instructions before activation. The direction for mounting and force activation is indicated on the ELT. A TSO-C91 ELT can be activated by using a quick rap with the palm. A TSO-C91(a) ELT can be activated by using a rapid forward (throwing) motion coupled by a rapid reversing action. Verify that the ELT is activated using a watt meter, or the airplane's VHF radio communications receiver tuned to 121.5 MHz, or other means (see note 1).

5. Reinstall the ELT into its mount and verify the proper direction for crash activation. Reconnect all cables. They should have slack at each end and should be properly secured to the airplane structure for support and protection.

6. Activate the ELT using the "on" switch or remote switch. A low-quality amplitude modulation (AM) broadcast radio receiver should be used to determine if energy is being transmitted from the antenna. When the antenna of the AM broadcast radio receiver (tuning dial on any setting) is held about 6 inches from the activated ELT antenna, the ELT aural tone will be heard (see notes 2 and 3).

7. Verify that all switches are properly labeled and positioned.

8. To satisfy the record keeping requirements of FAR Parts 43.9 and 43.11, we suggest the following:

   AFTT: _____
   I inspected the Make/Model _____ ELT system in this aircraft according to applicable aircraft and ELT manufacturer's instructions and applicable FAA guidance and found that it meets the requirements of FAR Part 91.207(c)1&2, (d) 1 through 4.
   The ELT battery expires on: _____.
   Panel remote battery expires on: _____.
   Signed: _____Certificate Kind & Number: _____ Date: _____

Note 1: This is not a measured check; it only indicates that the G-switch is working.

Note 2: This is not a measured check; but it does provide confidence that the antenna is radiating with sufficient power to aid search and rescue.

Note 3: Because the ELT radiates on the emergency frequency, the Federal Communications Commission allows these tests only to be conducted within the first 5 minutes after an hour and is limited to 3 sweeps of the transmitter audio modulation.

Questions regarding this guidance should be addressed to the Fairbanks Flight Standards District Office, (907) 474-0276.

THE ALTERATION MAZE AND THE IA
(Hugh Keith, Airworthiness Safety Inspector)

I think it is safe to say we here in Alaska do more alterations to small aircraft than anywhere else in the country. This includes properly approved alterations and, unfortunately, unapproved alterations. Regardless of the aircraft's alteration status, most of these aircraft will at some point show up at some IA's shop for its annual inspection.

Here is where we get into the maze. Unless the IA performing the inspection is very familiar with each specific make and model, he can miss the fact there may be alterations that were never approved. If the aircraft is inspected and approved for return-to-service with an alteration not approved what has happened? He has approved an aircraft for return-to-service following his inspection when it was not in a properly altered condition, refer to FAR Part 43.15(a)(1). It does not matter that he didn't actually do the alteration. He has put his hard earned certificate in jeopardy and also put he and his family into a liability situation should an accident cause be tracked back to the alteration. How do we protect ourselves from this situation? Lets start at the beginning.

The Bait
We mechanics know how pilots are, they've never seen an airplane they didn't want to modify in some way. If you're a pilot also, you know it's true. Anyway, most pilots eventually see some mod on someone's plane or in a magazine they must have on their own. Sometimes during our long winter nights they dream them up themselves. Just about every conceivable mod you could think of has been tried at one time or another. In most cases the intent is to make the plane perform better than originally designed. Some folks don't like anything on the market and build their own aircraft from scratch, but that's another story. Let's just say if the pilot takes the bait, let the IA, and any potential buyer both beware. There are airplane buyers who bought planes without knowing an alteration was not approved. They can't tell you, the IA, if they don't know.

The Certificate
Well, you've completed your annual inspection and signed it off as required by the Federal Aviation Regulations. You've certified the aircraft meets all applicable airworthiness requirements and is approved for return-to-service.

The Trouble
All is well until a few months later when an FAA inspector and an NTSB investigator show up at your shop asking questions about the aircraft you approved for return-to-service. It seems the pilot was involved in an accident and perhaps an unapproved alteration may have been a contributing cause. The FAA and NTSB are investigating the accident. Yes, you do remember inspecting the toe brakes thoroughly and they were okay. You were surprised when told this aircraft was certificated with heel brakes and no approval could be found for the alteration to toe brakes. The visit was made to you because yours was the last maintenance entry in the aircraft records. You feel frustrated and angry. Why hadn't the pilot told you about this? How many alterations can an aircraft have anyway? Now what do I do, how do I get out of this mess?

The Dilemma
The sad thing is, there is no graceful, self-respecting way out of such a dilemma. Does this sort of thing actually happen in real life? Yes, unfortunately it does, and with more and more alterations going on constantly, the problem is becoming more frequent and more complex.

The fact is, many alterations are good, in that they do improve an aircraft's performance in some way and perhaps allow an operation that would not be possible otherwise, or perhaps it makes the operation safer. We are of course speaking of properly approved alterations, not those others with no data and no approval.

The Answer
There is no easy answer. What can you do to avoid an unwanted and certainly unpleasant alteration surprise? The following are some suggestions; I'm sure you can think of some others:

1. Insist the aircraft owner bring in *all his records* with the aircraft to be inspected.

2. Base your conformity inspection on those records as well as the aircraft specifications. Look at the flight manual. Are there supplements with special requirements? Are parts required by STC or FAA field approval installed?

3. During the inspection specifically look for alterations not documented.

4. Ask the owner if he has had any alterations done since the last inspection. Most owners are very proud of their aircraft and will be glad to talk to you about it.

5. Perhaps most important of all, *know your aircraft!* If it is an aircraft you have not had much experience on, it is wise to be extra cautious. Here it's good to have a knowledgeable fellow mechanic assist you. Educate yourself thoroughly on the makes and models you normally work on and, don't hesitate to question anything you are not familiar with.

6. If you find an undocumented alteration, there is help available. It could be the owner's copy is lost. You can order the aircraft records of all major repairs and alterations from the FAA (there is only

minimal cost). If it is found there actually is no record of approval, then the approval must be done prior to return-to-service.

7. Last, during an inspection is a good time to look for *conflicting alterations*, especially if you are altering the aircraft yourself. How do you know if STC's or other alterations conflict? Read previous alteration data, flight manual supplements, the aircraft specifications, and then review again the proposed (or old if in question) alteration data. Basically, you need to see previously approved data, including drawings. If you're still not sure, ask for advice. Call the STC holder, the MFG, or the FAA. **GET IT RIGHT!**

FAIRBANKS FLIGHT STANDARDS
ANNUAL BASE INSPECTION REPORT

During the 1999 fiscal year, base inspections were conducted on all FAR Part 135 and 121 Commuter Air Carriers in the Fairbanks Flight Standards District. Below is a consolidated list of common discrepancies noted by the inspection team during their visits. We are including this information in the newsletter to help IA's and mechanics become more aware of these important, but often overlooked, items which may also apply to FAR Part 91 operations.

Aircraft Records

1. Failure to enter required signature or certificate number in applicable logbook or inspection report.
2. Failure to make logbook entry for maintenance performed.
3. Failure to show current status of an applicable Airworthiness Directive.
4. Failure to record required aircraft record entry for the FAR Part 91.207(d) Emergency Locator Transmitter (ELT) inspection IAW FAR Part 43.11.
5. Failure to enter Airframe Total Time for record entries for inspections.
6. Failure to enter Total Times of propellers or engines.
7. Inspection sheets not current with the instructions for continued airworthiness regarding items installed by way of STC or field approval.
8. Failure to give an adequate description of work performed.
9. Failure to record the ELT battery replacement.

Aircraft Spot Inspections

1. Aircraft Flight Manual/Pilot Operating Handbook Equipment List not complete, or not current.
2. Original hardware replaced with different type without approved data.
3. Aircraft Flight Manual/Pilot Operating Handbook weight and balance report not accurate or current.
4. Aircraft Flight Manual/Pilot Operating Handbook not complete, not current, or not the correct one.
5. Required placards missing.
6. Loose or missing hardware and fasteners.
7. Small dents, gravel damage, ice damage to aircraft skin and antennas.
8. Seat locks/stops missing.
9. Door seals missing or in disrepair.
10. Compass correction cards unreadable or not installed.
11. Standard procedures outlined in AC 43.13-1B were not followed. (For example; installation of hardware, cotter keys or safety wire.)
12. Aircraft skin, attach points or brackets cracked.
13. Static wicks missing.
14. Excessive hydraulic fluid or engine oil leaks.
15. Propeller spinners or bulkheads cracked.
16. Landing gear struts low or completely flat.
17. Incorrect instruments or parts installed in aircraft.

Aircraft Service Manuals

Failure to keep technical manuals current.

Tools and Equipment

1. List of calibrated tools not kept current.
2. Calibrated tools or equipment out of calibration.
3. No method or system for tracking calibrated tool due times.

IN CLOSING,

Compared to our last newsletter, this one was rather lengthy, but we hope you found the information useful. Since we can't mail to all A&Ps in our district, when you've finished reading the newsletter, please pass it on to one of your A&P buddies.

'Till next time--